

# Advanced Materials for Safe, High Performance Space-Rated Lithium-Ion Batteries, Phase I

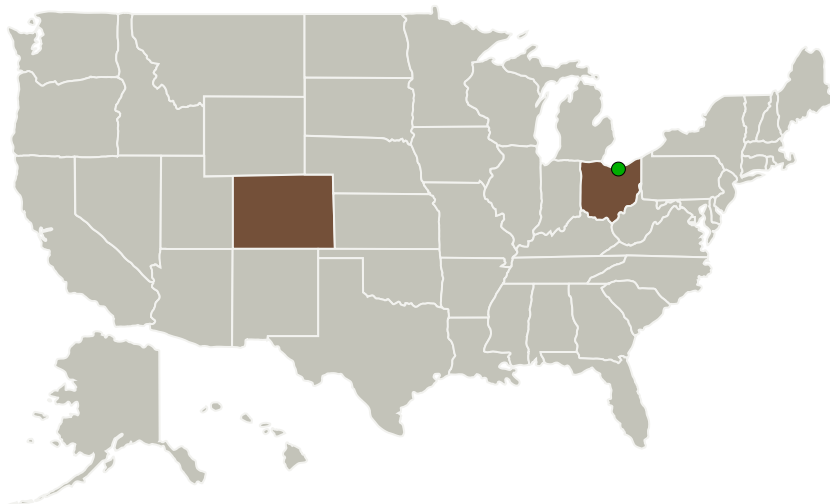
Completed Technology Project (2011 - 2011)



## Project Introduction

NASA space exploration vehicles are trending to higher pulse power, energy capacity levels and cycle life in order to meet exponentially increasing performance and lifespan requirements. As the demand for on-board power and total energy-storage capacity has continued to increase, there has been an increasing trend towards the use of battery technologies with higher energy- and power-density potential. Although substantial advancements have been made in this class of batteries over the past ten years by both domestic and foreign suppliers, substantial limitations still exist in: energy and power densities, operational temperature limits, safety, and lifecycle and lifetime performance. To address this need, ADA Technologies, Inc. proposes the use of advanced nanocomposite electrodes and ionic liquid electrolytes to enable increased performance and safety in lithium-ion batteries as compared to state-of-the-art devices. The high capacity, high rate capability and high cycle life performance potential of the proposed advanced nanocomposite electrodes in combination with the inherent non-volatility and non-flammability of ionic liquids holds substantial potential in meeting this objective. This proposed project will result in improved specific energy and power, wider operation temperature ranges, inherently safer operation, and excellent storage / cycle life as compared to current Li-ion batteries.

## Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
ADA Technologies, Inc.	Lead Organization	Industry	Littleton, Colorado
● Glenn Research Center(GRC)	Supporting Organization	NASA Center	Cleveland, Ohio

Primary U.S. Work Locations	
Colorado	Ohio

## Project Transitions

**February 2011:** Project Start**September 2011:** Closed out**Closeout Documentation:**

- Final Summary Chart(<https://techport.nasa.gov/file/137962>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

ADA Technologies, Inc.

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

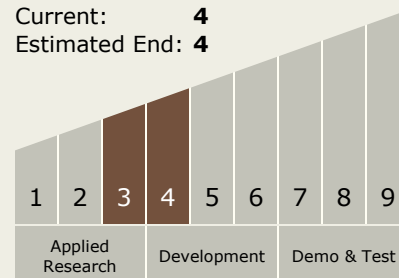
**Program Manager:**

Carlos Torrez

**Principal Investigator:**

Josh Buettner-garrett

## Technology Maturity (TRL)

Start: **3**Current: **4**Estimated End: **4**

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## Technology Areas

### Primary:

- TX12 Materials, Structures, Mechanical Systems, and Manufacturing
  - └ TX12.1 Materials
    - └ TX12.1.6 Materials for Electrical Power Generation, Energy Storage, Power Distribution and Electrical Machines

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System